

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the following discussion, is respectfully requested.

Claims 18-28 are currently pending in this application. No claim amendments are presented, thus no new matter has been added.

In the outstanding Office Action, Claims 26-28 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter; and Claims 18-28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Keller et al. (Vehicular Technology, IEEE Transactions on, Vol. 49, Issue 5, September 2000, pages 1893-1906, hereafter "Keller") in view of Sakoda et al. (U.S. Patent No. 6,882,618, hereafter "Sakoda").

Applicants thank the examiner for the courtesy of an interview with Applicants' representative, Mr. Sameer Gokhale, on July 29, 2009. During the interview, the rejections under 35 U.S.C. §101 and 35 U.S.C. §103(a) were discussed. Mr. Gokhale explained the difference between the claims and the combination of Keller and Sakoda. The examiner indicated that he agreed with Mr. Gokhale's explanation that Sakoda does not disclose or suggest precalculating a plurality of combinations x, y, and z defining x subcarriers, y subcarriers, and z subcarriers as defined in the independent claims. Arguments similar to those discussed during the interview are presented below for formal consideration.

With respect to the rejection of Claims 26-28 under 35 U.S.C. §101, Applicants respectfully traverse this ground of rejection. The Office Action takes the position that independent Claim 26 can be treated as being directed to a software embodiment. However, Claim 26 recites "a wireless multicarrier transmission device." It is respectfully submitted that the examiner has not shown that the entire wireless multicarrier transmission device recited in Claim 26 can be interpreted as being achieved strictly by software. The portions of the specification cited by the examiner (page 1, lines 9-11, and page 9, lines 28-30) indicate

that “a computer software program product is proposed which can implement a method as set forth above *when run on a computing device of a wireless transmitting device.*” Thus, the specification does not actually describe an example of a “wireless multicarrier transmission device” which is achieved *solely* by software. On the contrary, the specification explicitly describes software being run on a tangible device. Furthermore, MPEP §2601.01 (I) provides that:

“Computer programs are often recited as part of a claim. USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. **In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim.** The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. **Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material per se and hence nonstatutory.**” (Emphasis added).

Thus, even if the examiner were to interpret only part of the claim as being achieved by software, the examiner still cannot find the claim non-statutory unless it is shown that the entire claim can be interpreted as being achieved only by software. Therefore, it is submitted that the rejection of Claims 26-28 under 35 U.S.C. §101 must be withdrawn.

With respect to the rejection of Claim 18 under 35 U.S.C. §103(a), Applicants respectfully traverse this ground of rejection. Claim 18 recites, *inter alia*,

precalculating a plurality of combinations x, y, and z defining x subcarriers for modulation with a lower modulation scheme, y subcarriers for modulation with a standard modulation scheme, and z subcarriers for modulation with a higher modulation scheme (x, y, and z are integer numbers); wherein the sum of x, y, and z is n and a resulting number of coded bits of a multicarrier symbol is constant;

selecting one of the combinations for said multicarrier transmission in order to fix the integer numbers x , y , and z during said multicarrier transmission; and

modulating the x subcarriers having low fading channel profile information with the lower modulation scheme, modulating the y subcarriers having medium fading channel profile information with the standard modulation scheme, and modulating the z subcarriers having high fading channel profile information with the higher modulation scheme.

Applicants submit that Keller and Sakoda fail to disclose or suggest all of the features of Claim 18.

Keller is directed to an adaptive modulation method for duplex OFDM transmission. Keller teaches using N subcarriers and evaluating a channel transfer function for each subcarrier, and choosing a modulation scheme according to the resulting signal-to-noise ratio (SNR) for multicarrier transmission (see Section II.A and Section II.D). Keller describes that the modulation scheme is not to be varied on a subcarrier-by-subcarrier basis, but instead the total OFDM bandwidth of 512 subcarriers is split into blocks of adjacent subcarriers, referred to as “subbands,” and the same modulation scheme is employed for all the subcarriers of the same subband. (See page 1896, Section D, second paragraph). Thus, the modulation scheme allocation algorithms described by Keller on Section D are for determining a stored modulation scheme to applied to all the subcarriers in a subband (i.e., frequency block), but it is not explicitly for applying a respective modulation scheme based on grouping the subcarriers according to subcarriers having low fading channel profile information, subcarriers having medium fading channel profile information, and subcarriers having high fading channel profile information.

Applicants note that the Office Action takes the position that Keller discloses “selecting one of the combinations for said multicarrier transmission in order to fix the integer numbers x , y , and z during said multicarrier transmission.” However, in Keller, the

modulation scheme adaptation is performed by repeatedly searching for the block having the lowest value of a cost function parameter (see first paragraphs of section II.D.3). Therefore, Keller does not guarantee that the combination x, y, z of sub-carriers is fixed for the duration of the multicarrier transmission, but rather only for the duration of one modulation adaptation.

Furthermore, the Office Action acknowledges that Keller does not disclose or suggest “precalculating a plurality of combinations x, y , and z defining x subcarriers, y subcarriers, and z subcarriers.” The Office Action relies on Sakoda to remedy this deficiency of Keller.

Sakoda discloses a transmission apparatus for transmitting a multi-carrier modulated signal having a plurality of sub-carriers modulated in response to transmission data. The examiner cites to col. 23, lines 23-30 of Sakoda, which relates to a specific embodiment of estimation of the transmission path, wherein the frequency band is divided into a plurality of frequency blocks FB0 to FB3. Each frequency block comprises a predetermined number of OFDM sub-carriers (for example, 6). Columns 23 and 24 of Sakoda describe that at each modulation time, i.e., each time a modulation adaptation is to be performed, a transfer function is calculated for each frequency block.

In other words, Sakoda describes grouping sub-carriers into blocks and calculating one common transfer function for that block in order to perform the modulation adaptation. However, this is already similar to Keller’s description of “the bandwidth of 512 sub-carriers is split into blocks of adjacent sub-carriers, referred to as subbands, and the same modulation scheme is employed for all sub-carriers of the same subband.” (See page 1896, section D, second paragraph of Keller).

Thus, Sakoda describe applying the same modulation scheme to a predetermined number of subcarriers in a subband or frequency block, but it never discloses or suggests “precalculating *a plurality of combinations* x, y , and z *defining* x subcarriers for

modulation with a lower modulation scheme, y subcarriers for modulation with a standard modulation scheme, and z subcarriers for modulation with a higher modulation scheme,”
as defined by Claim 18.

Thus, Applicants submit that Sakoda fails to remedy the deficiencies of Keller with regard to Claim 18.

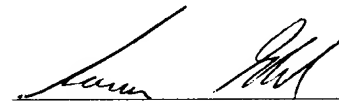
Therefore, Applicants respectfully submit that Claim 18 (and all associated dependent claims) patentably distinguishes over Keller and Sakoda, either alone or in proper combination.

Independent Claims 25 and 26 recite features similar to those of Claim 18 discussed above. Therefore, Applicants respectfully submit that Claims 25 and 26 (and all associated dependent claims) patentably distinguish over Keller and Sakoda, either alone or in proper combination.

Consequently, in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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